

**OBJECTIVE:** The purpose of this investigation was to compare the experiences of two US corporations, each employing over 50,000 workers and each offering a comprehensive benefit package, in terms of direct (i.e., medical and pharmaceutical) and indirect (i.e., sick leave and disability) costs of illness. **METHODS:** Based on a 1996 sample of workers ( $n = 9439$ ), retrospective medical and pharmaceutical claims at the employee level were linked with contemporaneous archival measures of productivity, including sick leave and disability. These results were normalized to the age-gender distribution of the US labor force. To assess the comparability of experiences at each company, direct and indirect burdens of illness were examined both in the aggregate as well as at the disease-group level. **RESULTS:** The average annual cost of illness per employee was \$3,272 in Company A (59% medical, 9% pharmaceutical, and 32% work loss) and \$3,574 in Company B (44% medical, 9% pharmaceutical, and 47% work loss). Although musculoskeletal diseases represented the greatest total cost outlay for both companies (i.e., 10% at Company A, 16% at Company B), the distribution of direct and indirect costs varied by diagnostic grouping. **CONCLUSIONS:** A traditional focus on direct costs alone would vastly understate the impact of illness to the employer, since for every dollar of direct expenditures, these companies spent between \$0.47 and \$0.87 on additional indirect costs. Worksite and employee health management programs tailored to the characteristics of the particular workforce in question could help maximize return on investment in employee health.

#### PWP2

### A METHODOLOGY TO MEASURE PRODUCTIVITY OF HEALTH OUTCOMES GROUPS

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Health Outcomes Research (OR) groups exist in most major pharmaceutical companies and are currently challenged to quantify their productivity and value to the organization. Per a recent Tufts survey, industry leaders expect continued growth in OR departments substantiating the need for metrics. **METHODS:** Our OR Department, positioned within Clinical Research, was approached by upper management to create a metrics reporting system. The group discussed a comprehensive list of departmental activities until core items were agreed upon. Using a 0-10 scale, items were ranked by perceived value to the company using the Delphi technique. To approximate time expenditure, complexity categories (1 = simple, 2 = moderate, 3 = complex), based on estimates of average number of workdays to complete each activity, were assigned to each item. **RESULTS:** An initial list of 20 items was reduced by the group to yield 11 core items: publications (1.8 = Delphi weight), models (1.4), strategic plans (1.3), protocols (0.9), instrument development (0.9), research reports (0.9), abstracts (0.7), reviews (0.6), analy-

sis plans (0.6), presentations (0.5), IPMs (0.4). The value-score was generated by multiplying the count of each item by its Delphi-weight then summed to result in a composite value-score. The complexity-score was calculated similarly. These two scores, reported separately to enhance understanding of both output and labor, were divided by the number of team members to produce productivity units per headcount. **CONCLUSION:** This metrics system represents one approach to valuing OR group contributions. We have implemented a validation and QA process to observe performance over time and assess appropriateness of the items selected. This system does not capture activities conducted to support departmental and organizational infrastructure. Therefore, is not appropriate for calculating standard costs or for valuing all contributions attributable to OR groups. In addition to concisely communicating OR activities to upper-management, metrics help team members focus on value-added activities and project prioritization.

#### PWP3

### CONSUMER PREFERENCES FOR DENTAL ANESTHESIA: PUTTING YOUR MONEY WHERE YOUR MOUTH IS

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**OBJECTIVES:** Consumer preferences and willingness-to-pay (WTP) were measured for a new dental anesthetic (dental gel) versus existing anesthetic options for periodontal recall cleanings. **METHODS:** The study was conducted by developing and administering a computer-based interactive survey to study subjects. First, clinical information was provided, describing periodontal disease, recall cleaning visits, and anesthetic options (no freezing, dental needle, and dental gel). Subjects were asked to choose which freezing option they would prefer, if they required freezing. Strength of preference for dental gel was measured using WTP: (1) at the subject's point of consumption, and (2) as a monthly dental insurance premium, for any dental plan beneficiary at the point of consumption. **RESULTS:** Both recall patients ( $n = 97$ ) and general population subjects ( $n = 196$ ) participated in the study. The majority of general subjects (81.0%) and recall subjects (82.5%) chose dental gel over other options. The majority of general subjects (86.7%) and recall subjects (83.8%) who preferred dental gel were willing to pay for dental gel. The median WTP to have dental gel available at the point of consumption was \$20.00 per visit for the general population, and \$10.00 for the recall population. The majority of general subjects (72.4%) and recall subjects (73.2%) were willing to pay an insurance premium for dental gel, even if they did not personally prefer dental gel. The median monthly premium was \$2.00 per month for both groups. **CONCLUSIONS:** Dental gel was overwhelmingly preferred by general and

recall subjects. Most subjects were willing to pay extra to have dental gel available, both for themselves and for others, at amounts far exceeding the projected acquisition price.

#### PWP4

### A WILLINGNESS-TO-PAY ASSESSMENT OF TWO TREATMENTS FOR OBESITY

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Willingness-to-pay (WTP) provides a method of valuing diverse outcomes of therapy in monetary units. The methodology is based on informed individual's willingness to make trade-offs between health and a wide range of commodities. **OBJECTIVES:** To determine the WTP for weight-loss with two new weight reduction therapies, orlistat (13.4 lbs) and sibutramine (12–14 lbs) in a Canadian population. **METHODS:** WTP was assessed in 97 volunteers between the ages of 20 and 64 using contingent valuation. Respondents were randomly assigned to one of two bid strategies with randomly chosen starting points. Demographic characteristics (i.e., age, sex, household income, education, smoking, height, weight, health-related quality of life (EuroQol), and previous attempts at weight-loss) were elicited using a standardized questionnaire. Main effects were tested by ANCOVA controlling for age, gender, education, income, smoking, and obesity (Body Mass Index = 30 kg/m<sup>2</sup>). **RESULTS:** Respondents had a mean age of 34.6 ± 10.6 years, were predominantly female (64.6%), and had a mean EuroQol score of 80.1 ± 15.9 (out of 100). Only 22.7% of the respondents were obese, however 61.9% reported having tried to lose weight. Respondents stated that they would be willing to pay an average of 13% ± 1.3% of their monthly household income for orlistat and 11.1% ± 1.3% for sibutramine (CDN\$521 (95% CI: \$450–\$593) vs. CDN\$446 (95% CI: \$375–\$518) respectively;  $F = 0.0805$ ,  $P = 0.371$ ) each month for a period of two years (CDN\$1 = US\$0.673). Estimates from respondents in older age groups ( $P = 0.001$ ) and higher income levels ( $p = 0.001$ ) were significantly associated with higher WTP values. **CONCLUSION:** Individuals in Ontario, Canada place a high value on pharmacologic therapies for weight reduction.

#### PWP5

### WORK PRODUCTIVITY EFFECTS OF DIABETES: IMPLICATIONS FOR RESEARCH AND POLICY

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Diabetes is known to cause workforce exit after complications develop, yet little research has examined the ef-

fects of the disease and its treatment on work efficiency while diabetics are employed. **OBJECTIVE:** The goal of this research is to determine whether or not diabetes is associated with lower levels of work productivity. **METHODS:** To measure work productivity, a survey was designed to collect data on work efficiency, as defined by Osterhaus, et al. and van Roijen, et al. The survey also included items about absences, work history, workforce exit, job satisfaction, income, demographics and health care utilization. The survey was administered to diabetic and non-diabetic people who were employed. **RESULTS:** On average, the 72 diabetics who completed the survey reported significantly lower work productivity than their 362 non-diabetic co-workers. Diabetics averaged the equivalent of seven hours of lost work time per month while non-diabetics lost only four hours per month ( $P = 0.03$ ). Surprisingly, the cost of these productivity losses was not significantly different between diabetics and non-diabetics. This is because the diabetics reported incomes that averaged \$10,000 less per year than their non-diabetic co-workers ( $P < 0.02$ ). **CONCLUSIONS:** Diabetics appear to be less productive at work than their non-diabetic peers, on average. The cost of lower productivity appears to be borne, at least in part, by the workers themselves, who earn significantly less than their non-diabetic co-workers, on average. Given the rising prevalence of diabetes and variations in treatment patterns, the effects of diabetes treatments on work productivity and career progression deserves consideration.

#### PWP6

### A PRELIMINARY STUDY OF PROVISION OF PHARMACEUTICAL CARE IN COMMUNITY PHARMACY IN SINGAPORE: COST ANALYSIS & PATIENT WILLINGNESS TO PAY

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In Singapore, provision of pharmaceutical care by community pharmacists is not widely practiced. However, two patient care centers were established in 1998 by a retail pharmacy chain to provide a range of specialized pharmaceutical care services. **OBJECTIVES:** This study aimed to investigate the feasibility of having such services in Singapore by (1) characterizing the customers utilizing the pharmaceutical care services offered to identify a target group most likely to benefit from such services, and (2) assessing customers' perception and acceptance of the services, as well as their willingness to pay for these services. **METHODS:** A questionnaire was constructed to evaluate the perception and acceptance of customers utilizing the pharmaceutical care services. The questionnaire was administered by a face-to-face interview. Qualitative analysis of the responses was performed and where appropriate, statistical analyses including ANOVA and unpaired t-test were performed. **RESULTS:** Seventeen customers completed the survey, representing 0.26% of the